ONTARIO MINISTRY OF ENVIRONMENT
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OPERATING SUMMARY

POINT EDWARD

water pollution control plant

1967

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P65
1967
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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

TD
367
.A56
P65
1967

Point Edward : water pollution control plant.
81826

ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET, TORONTO 5
OFFICE OF THE GENERAL MANAGER

Members of the Point Edward Local Advisory Committee,
Village of Point Edward.

Gentlemen:

We are happy to present you with the 1967 Operating Summary for the Point Edward Water Pollution Control Plant, OWRC Project No. 2-0036-59.

Your co-operation with our staff throughout the year has been appreciated. Only with such co-operation can the war against water pollution be waged effectively.

Yours very truly,

D. S. Caverly,
General Manager.

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ONTARIO WATER RESOURCES COMMISSION
801 BAY STREET
TORONTO 5

TELEPHONE 365-

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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Point Edward Water Pollution Control Plant, OWRC Project No. 2-0036-59.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

D. McTavish

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

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POINT EDWARD

water pollution control plant

operated for

THE VILLAGE OF POINT EDWARD

by the

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Assistant Director: C. W. Perry
Regional Supervisor: P. J. Osmond
Operations Engineer: R. E. Brown

801 Bay Street Toronto 5

'67 REVIEW

During 1967, the Point Edward Water Pollution Control Plant provided primary treatment and chlorination only for a total of 76.607 million gallons of sewage. This was an increase of 0.9% over 1966. Average removal efficiencies of 42.9% BOD and 67.6% for suspended solids were achieved for the year.

The operating costs for 1967 increased from the previous year by 4.6%. The cost per million gallons was increased by 3.74% but the cost per lb. of BOD removed dropped by 5%.

Routine inspections of the buildings, grounds and mechanical and electrical equipment revealed no major deficiencies during 1967. During 1967 the primary clarifier was sand blasted and painted. The gas piping in the digester was replaced by external p.v.c. piping. Many other pieces of equipment were overhauled as part of the scheduled maintenance program. The operator encountered no serious problem with the sewer cleaning program.

The Point Edward Water Pollution Control Plant is efficiently operated by Chief Operator Gordon Barwise. Assistance is provided on complex technical problems by OWRC head office technicians.

During 1967, casual help was used for weekend relief, holidays, and sickness.

Supervision at the plant is limited to 36 hours during the week-days and a two-hour call-in period on each day of the weekend. High sewage levels in the wet well at the plant, indicative of either a power or equipment failure, are telemetered to the operator's house where an alarm has been installed.

Mr. Barwise attended the Chief Operators' conference in Toronto in October, 1967.

PROJECT COSTS

NET CAPITAL COST (Estimated) Long Term Debt to OWRC	$779,773.82
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	$119,691.67
Net Operating	$ 13,419.58
Debt Retirement	15,736.00
Reserve	4,198.90
Interest Charged	43,974.13
TOTAL	$ 77,328.61

RESERVE ACCOUNT

Balance at January 1, 1967	$ 32,130.14
Deposited by Municipality	4,198.90
Interest Earned	1,891.65
	$ 38,220.69
Less Expenditures	(1,163.13)
Balance at December 31, 1967	$ 37,057.56

MONTHLY OPERATING COSTS

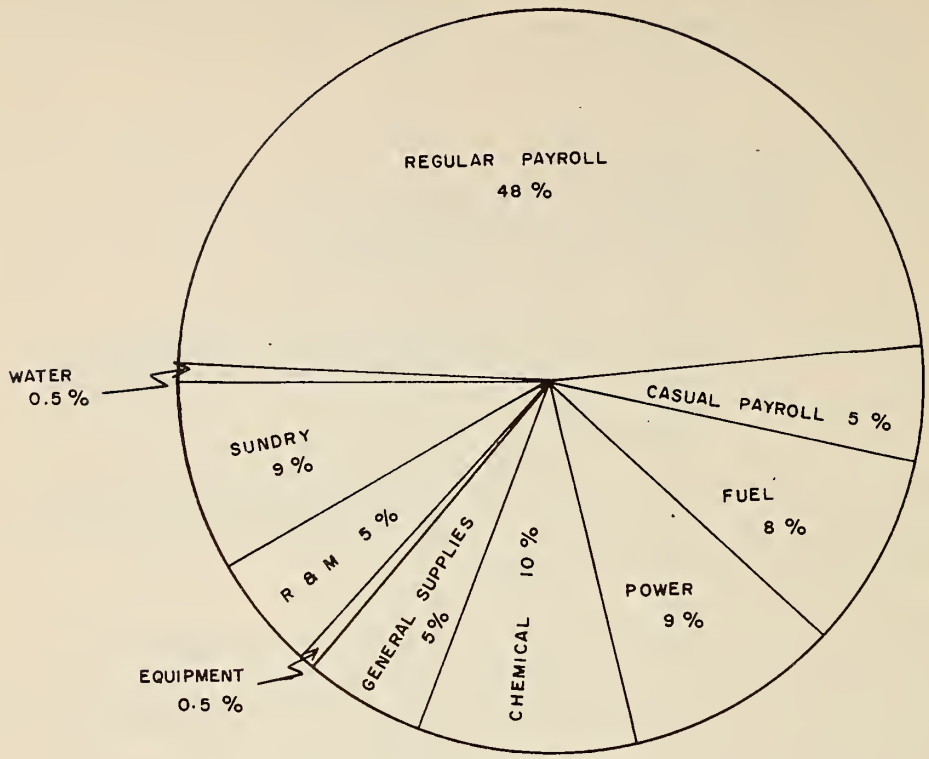
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER
JAN	792.[illegible]7	442.09	43.47	163.87	96.87		26.37			19.60	
FEB	780.78	435.82	37.00	125.10	90.79		38.35		22.70	31.02	
MARCH	1363.13	781.69	73.17	145.15	91.91		71.50	10.54	34.19	154.98	
APRIL	1112.26	489.79	47.70	131.66	94.13	207.11	93.70	15.11		19.60	13.46
MAY	1168.27	525.21	66.36	88.51	106.16	207.11	44.64		98.00	32.28	
JUNE	873.53	477.18	8.00	77.18	100.22		61.78		65.68	83.49	
JULY	934.38	492.50	77.62	58.57	100.49		64.85	46.15	62.22	22.35	9.63
AUG	1293.57	497.62	140.76	50.99	98.90	217.51	42.25		184.42	61.12	
SEPT	1078.01	759.44	90.46	23.89	95.66		97.32			11.24	
OCT	1199.42	496.24	74.50	59.64	152.24	217.51	32.39		96.61	70.09	
NOV	1482.68	490.14	28.00	51.87	97.65	217.51	42.09			509.25	46.17
DEC	1341.48	490.14	24.00	130.04	100.40	207.15	108.66		120.23	160.86	
TOTAL	13419.58	6377.86	711.04	1106.27	1225.42	1273.90	723.90	71.80	684.25	1175.88	69.26

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE $248.40

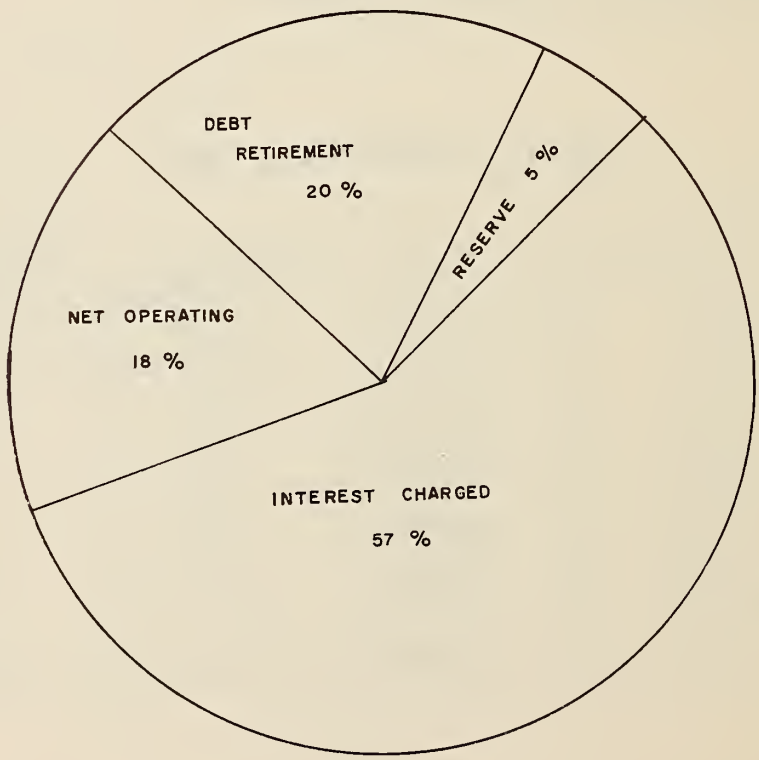
YEARLY OPERATING COSTS

YEAR	M. G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1962	56.500	$ 9670.86	$171.17	$ 0.15
1963	64.907	11343.38	174.26	0.22
1964	66.626	12451.09	186.88	0.23
1965	71.180	13272.64	184.83	0.23
1966	75.918	12800.22	168.61	0.21
1967	76.607	13419.58	175.17	0.20

1967 OPERATING COSTS



TOTAL ANNUAL COST



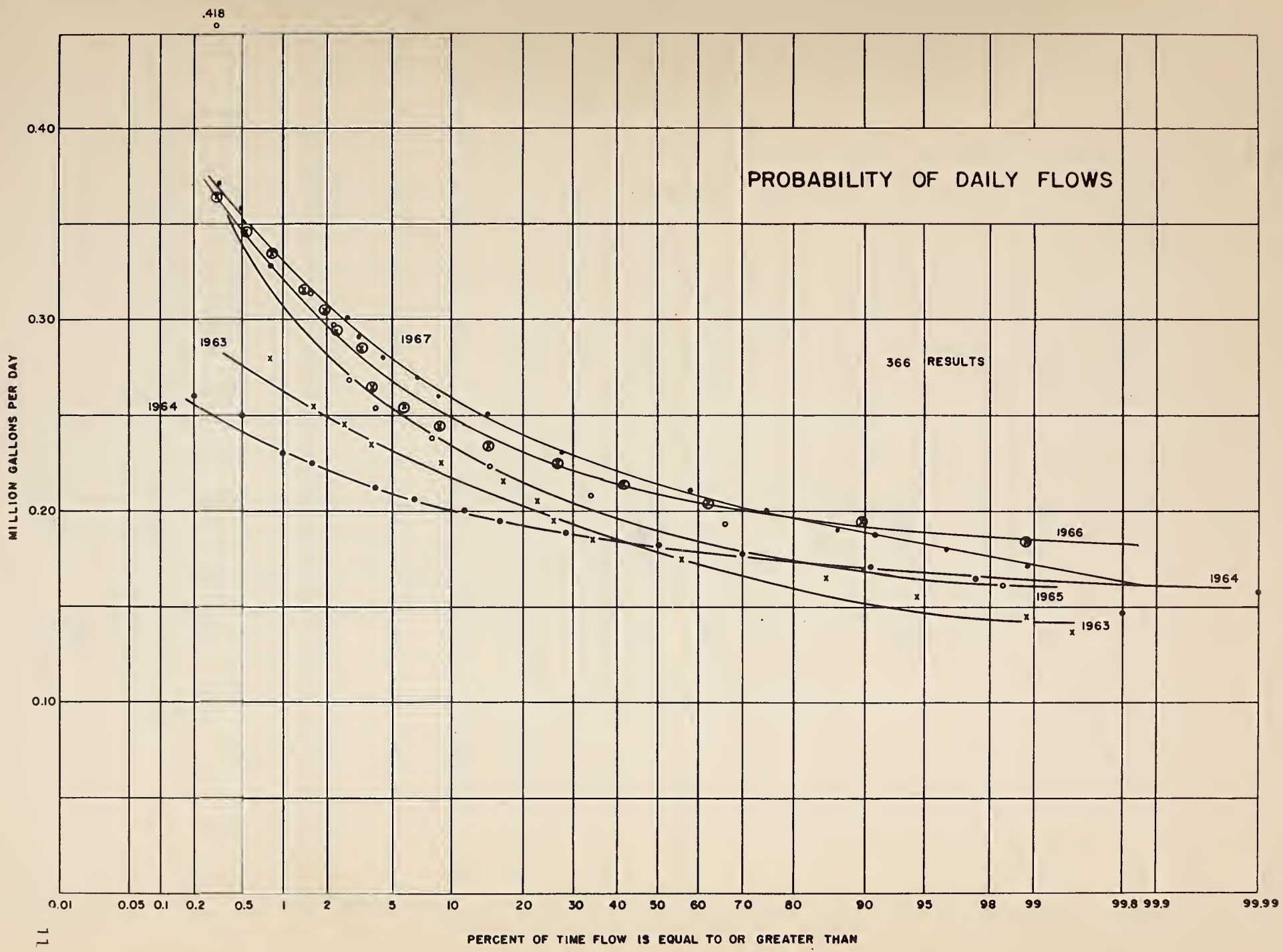
Process Data

Flows

A total of 76.607 million gallons of sewage was given primary treatment during 1967. This is an increase of 0.9% over the 1966 total flow of 75.918 million gallons. The average daily flow for the year was 0.210 million gallons resulting in the plant being loaded hydraulically to 37.1% of its design capacity.

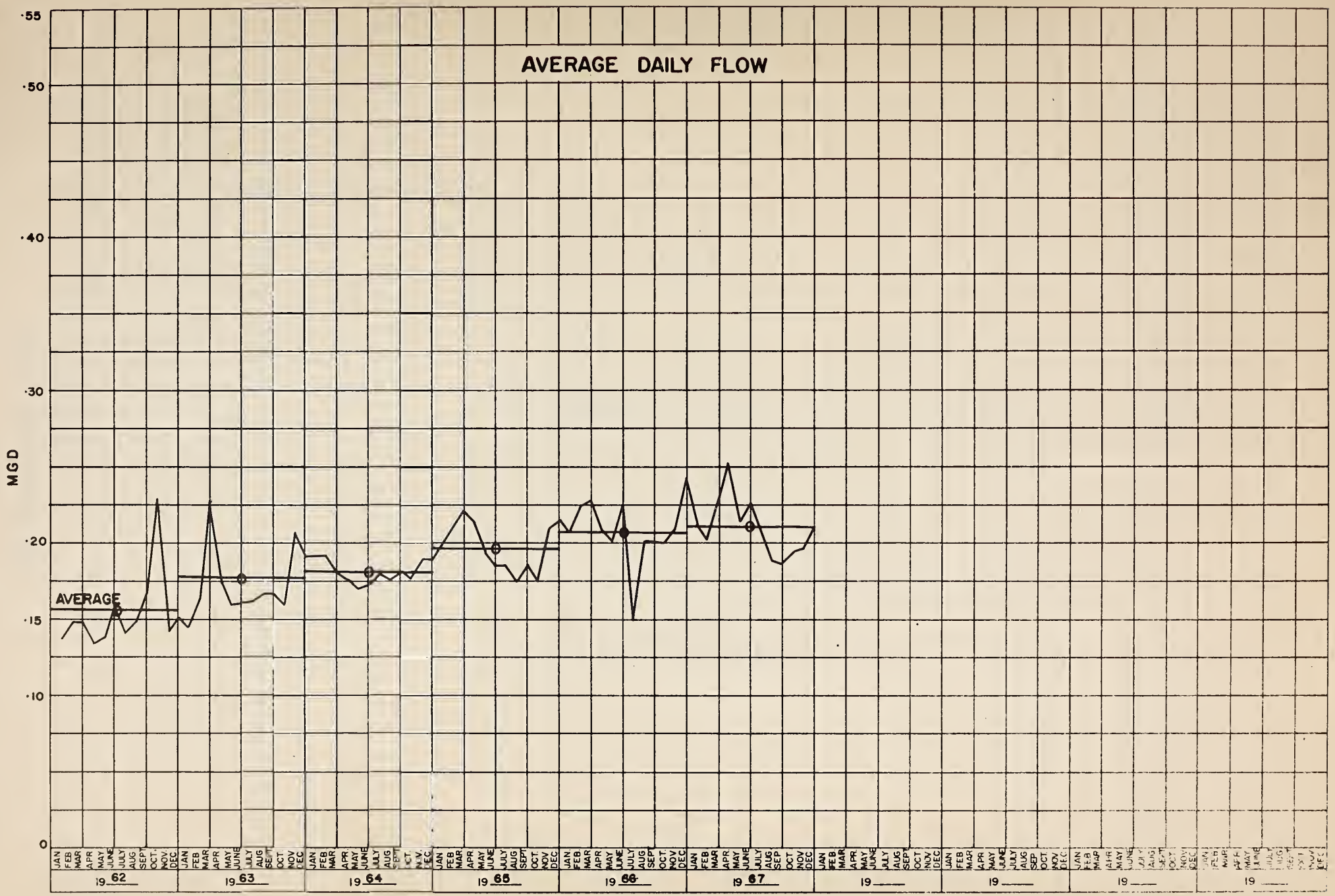
The maximum daily flow for the year occurred on December 21 when a total flow of 369,200 gallons was received at the plant. The minimum daily flow for the year of 95,400 gallons occurred on July 25. The greatest monthly flow occurred in April.

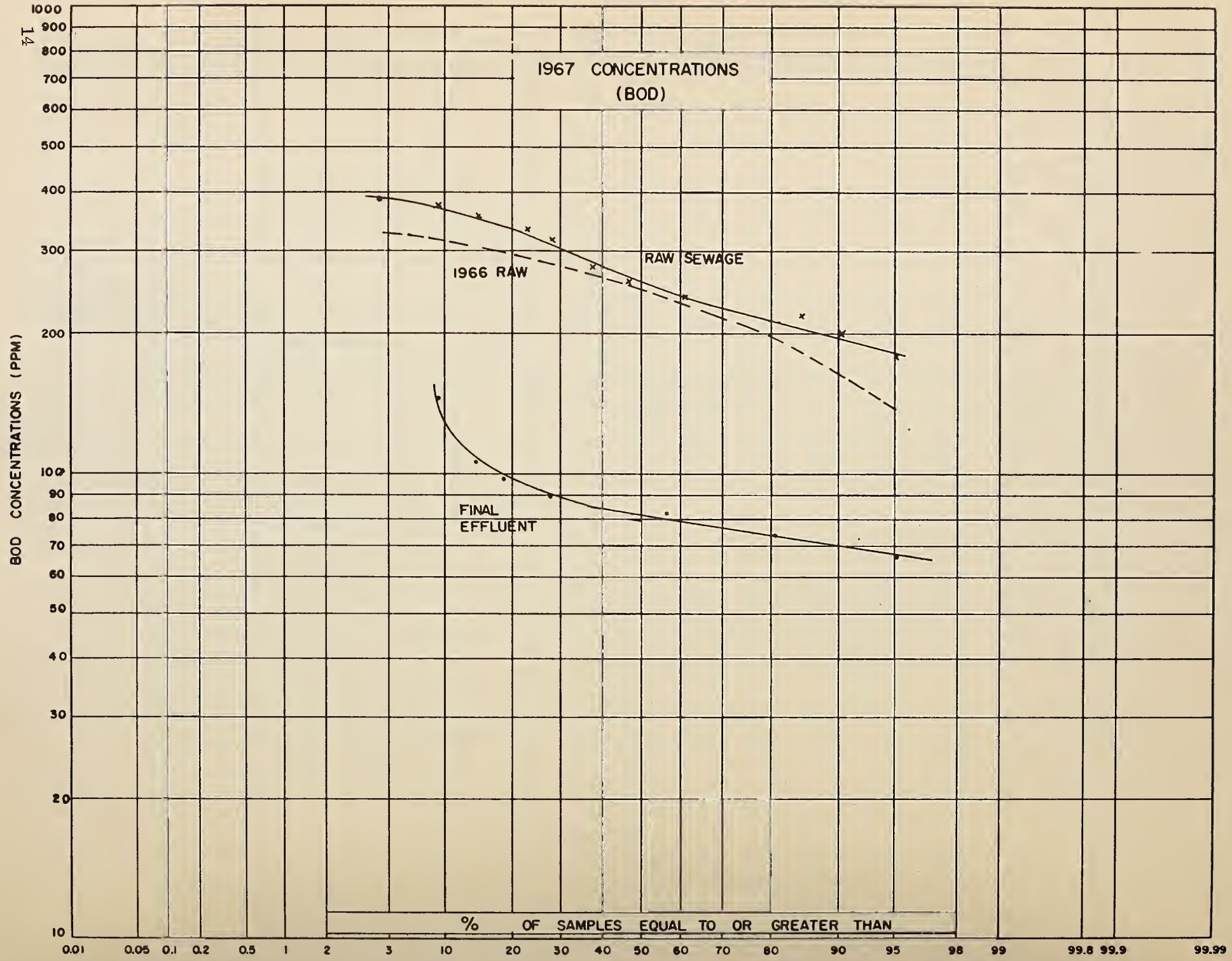
The average daily flow graph for five years of operation shows a gradual increase in flows. At the present rate, based on six years' data, the plant will reach hydraulic capacity in about 38 years. During 1967, the maximum flow for one day was 64.9% of the design flow.

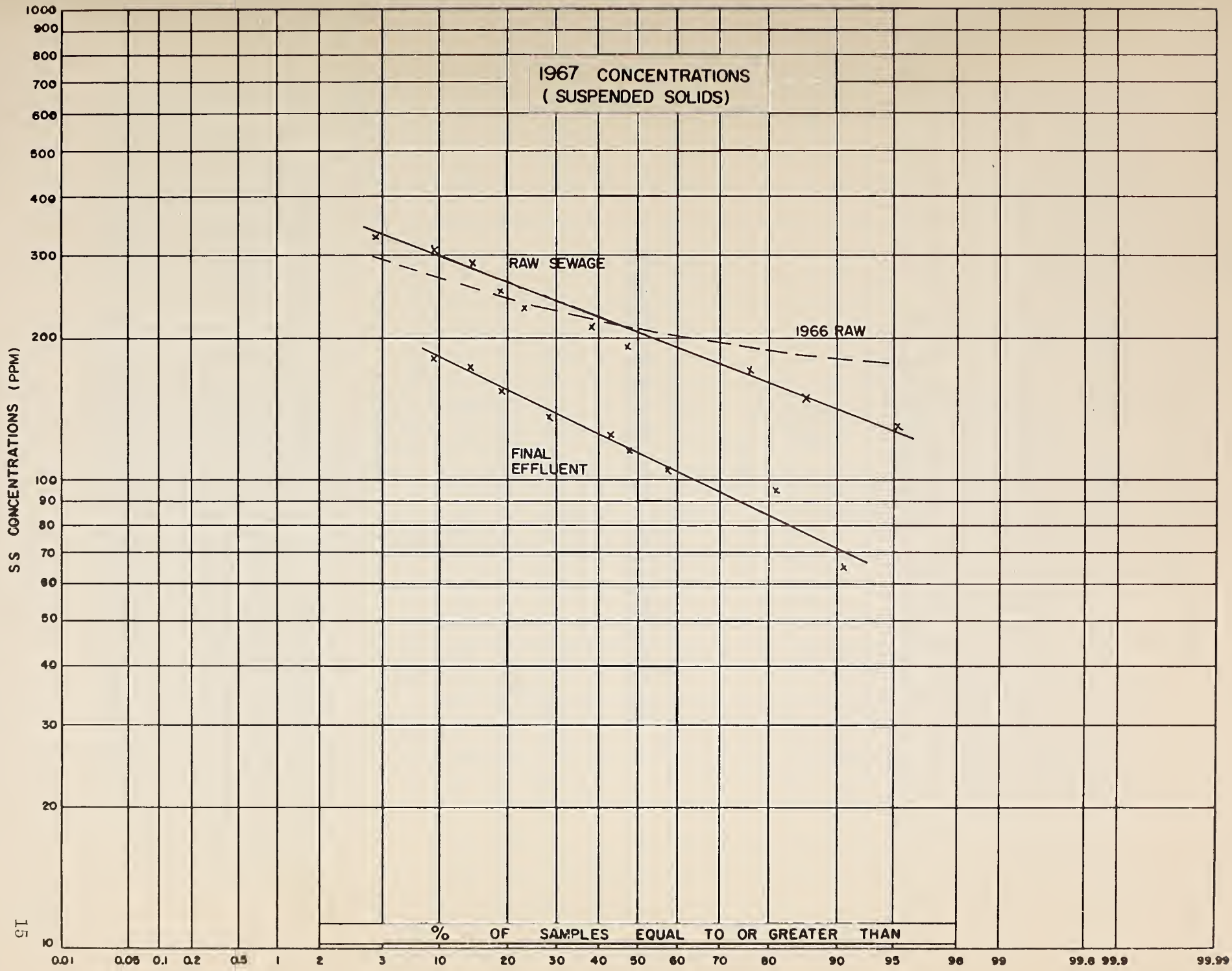

PROBABILITY OF DAILY FLOWS
366 RESULTS
.418
1963
1964
1967
1966
1964
1965
1963
0.40
0.30
0.20
0.10
MILLION GALLONS PER DAY
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN

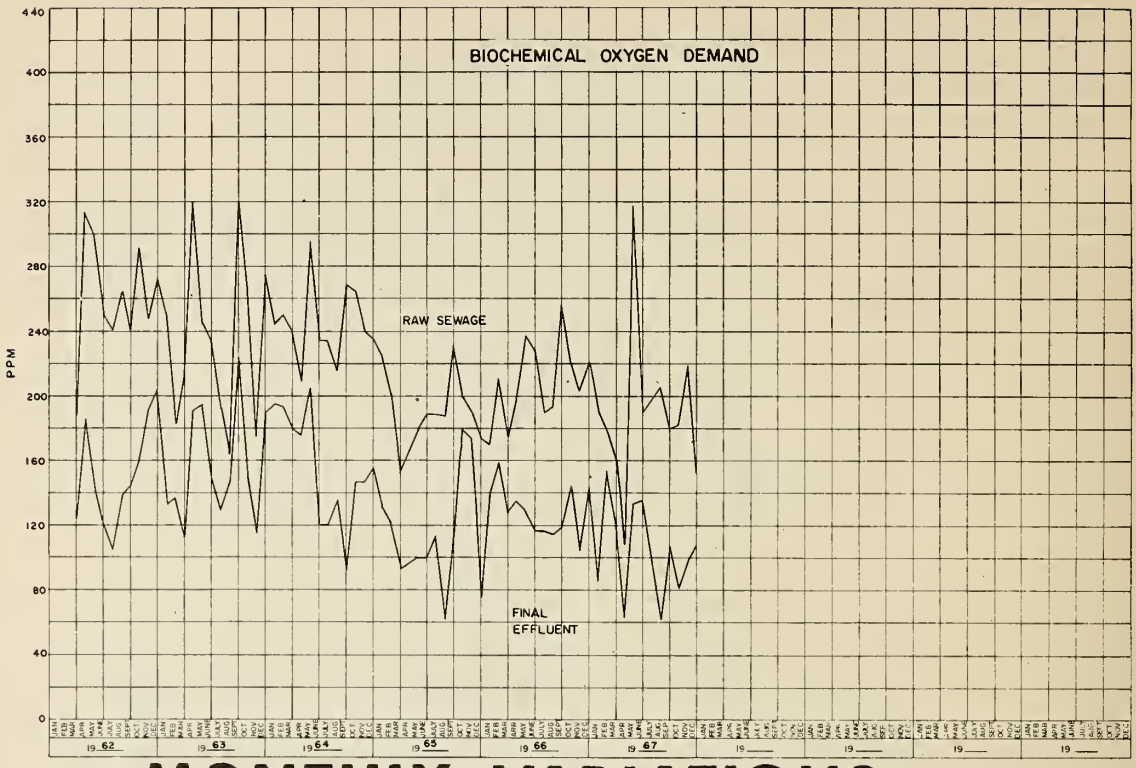
FLOW DATA

Month	Total Flow (MG)	Avg. Daily Flow (MGD)	Max. Daily Flow (MG)	Min Daily Flow (MG)	Max. Rate (MGD)	Min. Rate (MGD)
January	6.584	.212	.277	.190	.450	.045
February	5.676	.202	.222	.188	.350	.045
March	7.086	.229	0.2.58	.202	.350	.060
April	7.556	.252	.334	.212	.500	.060
May	6.644	.214	.246	.182	.285	.030
June	6.789	.226	.291	.186	.500	.035
July	6.423	.207	0.2.65	.095	.500	.050
August	5.853	.189	.223	.170	.300	.035
September	5.566	.186	.244	.158	.300	.030
October	6.024	.194	.298	.153	.500	.035
November	5.890	.196	.281	.169	.355	.050
December	6.516	.210	.369	.167	.325	.050
Total	76.607					
Average	6.384	.210				

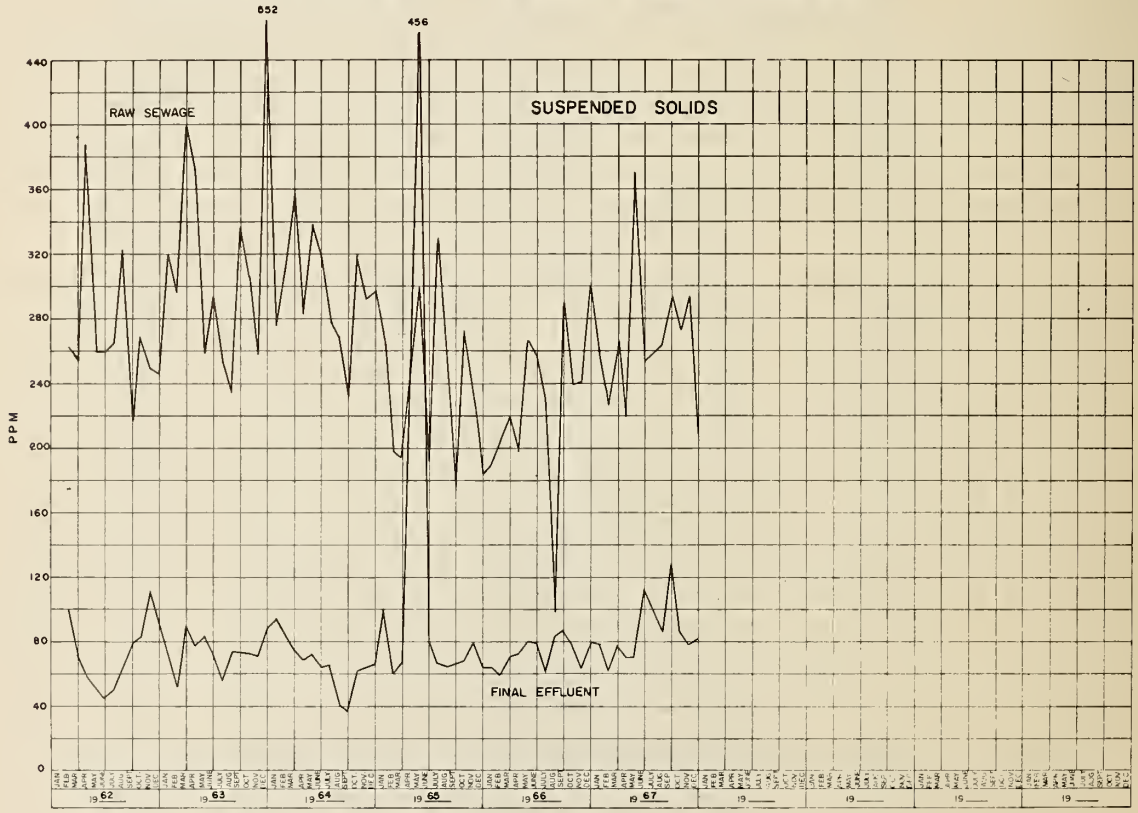

AVERAGE DAILY FLOW
MGD
·55
·50
·40
·30
·20
·15
·10
0
AVERAGE
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT. NOV. DEC
19 62
19 63
19 64
19 65
19 66
19 67
19 ____


1967 CONCENTRATIONS
(BOD)
RAW SEWAGE
1966 RAW
FINAL
EFFLUENT
BOD CONCENTRATIONS (PPM)
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
% OF SAMPLES EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99


1967 CONCENTRATIONS
(SUSPENDED SOLIDS)
RAW SEWAGE
1966 RAW
FINAL
EFFLUENT
SS CONCENTRATIONS (PPM)
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
% OF SAMPLES EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
3
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	192	86	55.2	3.49	257	78	69.6	5.89	13.30
FEB.	179	154	14.0	7.09	226	61	73.0	4.68	8.90
MAR.	162	123	24.1	1.38	264	78	70.4	6.59	14.40
APR.	108	63	41.7	.35	217	70	67.7	5.55	9.05
MAY	314	133	57.6	6.01	368	70	81.0	9.90	7.60
JUNE	188	136	27.6	1.76	252	112	55.6	4.75	12.20
JULY	* 190	104	42.9	2.76	*265	84	67.6	5.81	8.15
AUG.	207	61	70.5	4.27	264	86	67.4	5.21	15.55
SEPT.	180	106	41.1	2.06	294	127	56.8	4.65	22.15
OCT.	182	80	56.0	3.07	273	86	68.5	5.63	16.35
NOV.	220	99	55.0	3.56	294	77	73.8	6.39	8.95
DEC.	153	108	29.4	1.47	204	81	60.3	4.01	9.27
TOTAL	-	-	-	32.94	-	-	-	69.33	145.87
AVG.	190	104	42.9	2.75	265	84	67.6	5.78	12.16

* Average values substituted.

COMMENTS

The raw sewage BOD averaged slightly lower in 1967 when compared to the 1966 value of 209 ppm; however, the suspended solids concentration increased from 228 ppm in 1966 to 265 ppm in 1967. These results are based on twice monthly samples only. The plant provided an average reduction of 42.9% for BOD and 67.6% for SS. These results are comparable to the 1966 values. Removal of SS is higher than the 50% design value due to the low hydraulic load factor; however BOD removal approximates the design level.

Grit removal averaged 1.9 cubic feet per million gallons and is within the range normally encountered.

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS		
	GALLONS	% SOLIDS	% VOL MAT	GALLONS	% SOLIDS	% VOL. MAT
JAN	27,550	6.34	90.53	4548	5.07	58.38
FEB	22,875	3.24	79.93	3032	4.93	58.42
MAR	25,575	3.45	82..31	3032	4.85	74.02
APR	24,750	1.61	39.75	3032	5.86	57.50
MAY	25,575	3.01	51.30	4548	2.92	58.45
JUNE	24,750	2.46	65.21	3032	5.54	58.00
JULY	38,325	-	-	1516	-	-
AUG.	40,300	3.06	69.93	4548	5.37	57.17
SEPT.	38,300	4.60	64.41	3032	3.71	53.19
OCT.	36,900	3.83	75.72	3032	5.53	56.96
NOV.	32,400	2.88	74.90	3032	5.39	60.73
DEC.	32.550	3.27	80.43	3032	4.72	37.47
TOTAL	369,850	-	-	39416	-	-
AVG.	30,821	3.43	70.40	3285	4.90	57.30

COMMENTS

Again in 1967, there was an increase in the amount of raw sludge pumped to the digesters. This increase of 14.4% was greater than the flow increase of 0.9% and reflects a continued decrease in the efficiency of the clarifier in the concentration of raw sludge. The 39146 gallons of digested sludge removed was 10.7% of the raw sludge. There was a total reduction of volatile matter during the year of 82.1%. The hauled sludge in 1967 averaged a lower concentration of solids than in 1966. Its volatile content was 57.3% of the solids. The methane produced from the digestion process was burned as a waste product. Digested sludge was hauled and disposed of at a cost of $1.20 per cubic yard.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (P.P.M)
JANUARY	6.584	787	11.95
FEBRUARY	5.676	664	11.70
MARCH	7.086	* 351	6.15
APRIL	7.556	** 657	8.99
MAY	6.644	792	11.92
JUNE	6.789	804	11.84
JULY	6.423	** 774	12.89
AUGUST	5.853	799	13.65
SEPTEMBER	5.566	869	15.61
OCTOBER	6.024	889	14.76
NOVEMBER	5.890	886	15.04
DECEMBER	6.516	937	14.37
TOTAL	76.607	9209	-
AVERAGE	6.383	768	12.40

* Chlorination for 25 days
** Chlorination for 29 days

COMMENTS

Disinfection of the final effluent from the Point Edward plant is practiced 12 months of the year. During 1967, 9,209 pounds of chlorine were required at an average dosage of 12.40 ppm. This is nearly the same as the 12.08 ppm dosage rate in 1966. The effluent is discharged to the St. Clair River approximately 1200 feet downstream from the City of Sarnia water intake.

CONCLUSIONS

The plant operated at 36.9% of capacity and has considerable reserve. It should not require hydraulic expansion for a good many years. Since the plant is only a primary plant, it has never met the OWRC objectives in BOD and SS reduction of 15 ppm. There was an increase in total cost of operation over 1966 to $175.17 per million gallons treated.

RECOMMENDATIONS

The development of a marina, golf course and park in the immediate area downstream of the treatment plant make it desirable that consideration be given to providing secondary treatment at this plant.

ONTARIO WATER RESOURCES COMMISSION